

SITING GUIDELINES

Siting Guidelines for Wireless Communications Facilities

Introduction:

The purpose of this document is to establish criteria for siting future public wireless communications facilities so as to lessen the impacts on the adjacent community and highway facilities. Included are considerations for preserving the operational safety as well as the functional and aesthetic qualities of the highway. Sites shall not adversely impact the safety and operations of Caltrans workers.

Elements of Policy:

The following areas of concern need to be addressed for controlled access highways. Conventional highway siting will continue to be addressed under the permit process. Areas outside controlled access right of way will be sited in accordance with the Caltrans program managing the property being leased.

Official Policy established by the Design and Local Programs Program (DLPP) - July 1997:

Clearances from the traveled way: Minimum distances from any proposed wireless facility to the traveled way of either the main line or ramp lines shall be as described in the Caltrans Highway Design Manual Section 309, "Clear Recovery Zones". Antenna attachments to existing Caltrans facilities will not be subject to Section 309. The manual may be purchased from the Caltrans Publication Unit or viewed from Caltrans web page: <http://www.dot.ca.gov/hq/oppd/hdm/hdmtoc.html>

Safety: Access to the wireless facility for construction and maintenance shall only be from outside the controlled access right of way. Normally access shall not be allowed from the traveled way. Applicants will be required to access the right of way from established frontage roads or obtain agreements from adjacent property owners to allow access through private or other public properties. Service for power and telephones will also be from outside the controlled access right of way. When it is necessary to access the facility by passing through a Caltrans controlled access right of way fence, the Caltrans policy requires a locked gate. Antennas, once attached to Caltrans structures and adjusted, shall only be serviced or replaced if damaged by traffic, vandalism or an act of God. Caltrans shall only be liable for damage caused by Caltrans work forces.

Site Compatibility: District Landscape Architecture Offices (DLAO) will review proposed facilities for site compatibility (landscaping, scenic viewsheds, etc.). Siting shall not violate any other Caltrans standards, policies, or guidelines. The new facility must be aesthetically compatible with Caltrans and local aesthetic qualities. Facilities may be allowed if site design can be modified to reduce adverse visual effects. Site design must comply with DLAO requests. The facilities must be compatible with community desires; no facilities will be sited in areas which are objectionable to the local community. Sited facilities should not create a visual element that would be distracting to adjacent property owners and the traveling public. Above ground vaults should blend into the surrounding area as much as feasible. Antenna designs should be innovative so as not to attract special attention. Landscaping removal and replacement plans shall be approved by DLAO.

Facilities will not be permitted to be installed if they are visible from a designated or eligible State Scenic Highway.

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Structural Compatibility: Any above ground wireless facilities (towers, vaults, etc.) shall be subject to Caltrans review to determine structural adequacy. If antennas are mounted on Caltrans facilities, the Caltrans facilities must be structurally adequate to support the attachments. Normally, such facilities as existing sign support towers, sound walls, and Caltrans towers will require only a minimum review.

Communications Compatibility: Proposed wireless equipment shall not interfere with existing or planned state communications systems within a two mile radius of the proposed wireless site. An intermodulation study shall be made at the expense of the wireless provider. The components and results of the study shall be approved by Caltrans prior to proceeding with the site licensing process.

Highway Needs: Shall not change the current or future use of the highway facility. Future construction needs may preclude installing a wireless facility at a given location and/or require the wireless facility to be relocated at the expense of the provider. The district should review future plans for modification of the highway system before agreeing on a site location for a proposed wireless facility.

Exceptions: The District Airspace Review Committee (DARC) is responsible for insuring compliance with these siting guidelines. The committee will process requests for exceptions to these guidelines to the Office Chief, Encroachment Exceptions, Design and Local Programs for review. Final approval shall be by the Federal Highway Administration (FHWA).

Specific Program Guidelines:

Landscape and Aesthetic Design Requirements

Caltrans desires to make wireless communications facilities as inconspicuous as is reasonably possible; and to ensure a design compatible with the visual quality of the highway corridor and adjacent land uses.

1. Facility locations shall be selected to require a minimum amount of site disturbance.
2. The quantity of antennas approved along a corridor will not be allowed to impact the aesthetics and visual impact to the corridor.
3. To the maximum extent feasible, existing vegetation shall be preserved to provide visual screens and buffers.
4. Erosion and sediment shall be controlled. Sediment shall not be allowed to leave the facility site.
5. Architectural treatments, color coordination, new or replacement planting, and other visual screening treatments may be required.
6. Placement shall accommodate the need for plantings or other screening treatments between the proposed facility and adjacent land uses.
7. Where substantial screen planting or replacement planting is required, such work shall include an appropriate irrigation system and plant establishment for a period of up to one year.
8. The applicant shall provide computer generated photographic quality visual simulations (or other visual simulations) suitable to demonstrate the visual effects of the proposed facility.

References:

- California Department of Transportation, Highway Design Manual, Fifth Edition, Chapter 900, pages 900-1 through 900-14.
- California Department of Transportation, Guidelines for the Official Designation of Scenic Highways, March 1996, pages 3-6 and pages 25-26.
- California Department of Transportation, Environmental Handbook, Volume 1, Chapter 2, Section 2-3.3, "Scenic Resource Determination."

Park and Ride Facilities

Any proposal by a wireless-communications carrier for a site on a state-owned park and ride facility (P&R) should consider the "Landscape and Aesthetic Design Requirements" previously described. The following should also be considered:

1. Whenever possible, wireless facilities should be placed in areas of the P&R facility that do not require taking up designated parking spaces.
2. If it is necessary to use existing parking spaces, only P&R facilities not operating at capacity should be considered. If the taking of a parking space or more requires the displacement of a commuter, the wireless facility should be placed elsewhere or not be licensed at that particular site.
3. Whenever parking spaces must be used for wireless facilities, those spaces ceded should be the ones least likely to interfere with traffic movement within the P&R facility.
4. Placement of the wireless facility should take into account the disabled commuters, who may be using the P&R, by not interfering with any possible movement they may need to take upon exiting their cars to change modes of travel, such as vanpools or transit, originating within the P&R or externally.

Maintenance Stations

1. When siting on non-highway facilities, service provider is responsible for maintaining all existing services during construction, as per encroachment permit requirements.
2. When installing wireless service equipment on state owned/maintained lighting or signal standards, the service provider is responsible for determining conduit/wiring requirements as per the Cal-OSHA Low Voltage Electric Safety Orders, Caltrans Standard Specifications and Plans, Caltrans Signal and Lighting Design Guidelines, the National Electric Code, and any other design guidelines that are used by Caltrans. The service provider is also responsible for installing any upgrades in conduits/wiring, including removing and replacing foundations, if necessary. Wind and seismic loading calculations and foundation designs of new towers to be installed on maintenance station grounds will be design checked.
3. No towers or poles will be installed on existing maintenance station structures without prior written approval of the District Deputy Director for Maintenance of designated representative.
4. Wind and seismic loading calculations and foundation designs of new towers to be installed on maintenance station grounds will be design checked.

5. To prevent Caltrans vehicles from damaging a wireless facility: No less than four 8 foot long guard posts will be installed surrounding any new towers erected at a Maintenance Station. Posts will be no less than 6 inch diameter, and made of schedule 40 galvanized steel. Posts will be installed four feet below the finished grade of the structural section adjacent to the tower, with a 1 foot diameter concrete footings surrounding each post to a depth of no less than 3 inches below the bottom of the post. Below grade, posts will also be filled with concrete. A one inch circular concrete cap will be installed at the top of each post (This method is preferred over fencing the facility).
6. Towers or poles will be sited outside the turning radius of the largest piece of equipment used at the maintenance station (truck with low-boy trailer, snowplow, grader, etc.).
7. Antennas will maintain a 2 foot minimum vertical clearance from the highest piece of equipment used at the maintenance station (lift-mounted one-ton truck, truck with CMS/arrow board, spray rig, snow plow, etc.). The intent is for the top of the rig to avoid damaging (miss the bottom of) the antenna.
8. Storage of equipment and materials will not be permitted in the Maintenance Station grounds, outside of the carrier's enclosure or licensed enclosed space. Parking and landscaping may be excepted.
9. The placement of equipment cabinets shall not interfere with operations of the facility, interfere with access to any portion of the facility, nor compromise safety.
10. Maintenance pullouts shall not be of proximity that it interferes with acceleration into and deceleration from the traveled way.

Structures: Bridges and Poles [sign and lighting]

General

1. Encroachments should not be exposed to view and shall not be permitted on the exterior of a bridge unless they are enclosed and appear as an integral part of the bridge. Structures Maintenance may approve exceptions for unusual circumstances.
2. First preference: Locate the telecommunication equipment on separate poles, off bridge structures when possible.
3. Placement of telecommunications equipment shall be permitted on the exterior of bridge structures only when it is not feasible to place the encroachment off, or in the interior of, the structure. Applicants requesting conceptual approval for placing appurtenances on the exterior of bridge structures must show why it is necessary to use the exterior of a structure. A lower installation cost will not necessarily be considered justification for installing on the exterior of a bridge structure.
4. Condition at the site shall remain as safe as before the encroachment was installed.
5. The encroachments' design, installation and maintenance should not have adverse effect on State bridges structurally or aesthetically.
6. The ability to perform structures maintenance inspection repairs or other maintenance operation shall not be impaired by encroachment.
7. All proposals submitted should include bridge plans, right of way limits, and location of the encroachment.
8. Electrical and communication lines shall be encased in rigid metallic conduit. Electrical conduit shall be grounded according to the general order of the California PUC and the electrical safety order of Cal-OSHA.

Installation on Bridge Structures

When there is no reasonable alternative to installing on the exterior of a bridge structure a permit may be granted when the encroachment conforms with the following provisions.

1. Conditions at the site shall remain as safe as before the encroachment is installed.
2. Equipment that may distract a vehicle operator from safe negotiation of the highway at or near a State Facility shall be prevented from placement on the State facility. This includes encroachments that may distract a driver when the equipment is serviced or maintained.
3. The ability to perform maintenance inspection, repairs or other maintenance operations shall not be restricted by the encroachment.
4. The life expectancy of the bridge shall remain unchanged.
5. The aesthetic architectural and historic value of the structure must be maintained.
6. Operating and maintenance of the encroachment must not interfere with traffic operations on or near the structure.
7. Wireless antenna panel should be placed behind the existing sign structures.
8. When there is no traffic sign attached to the bridge, the applicant should get conceptual approval before preparing the plans.
9. The Electrical or Communication Lines should be installed inside the bridge for box girder bridges or between the girders for bridges with no soffit. Conduits can be cored through abutment to the street and from there to the ground installation.
10. When there is not a soffit access opening, a design for the opening should be proposed.
11. No installation are allowed on POC. (Exception may be reviewed on case by case.)
12. Attachments shall not be placed where access and maintenance may be difficult or unsafe. Access and maintenance to existing elements shall not be limited or prevented in any way.
13. Additional elements, including conduits, wiring, and communications equipment at any structure shall not interfere with the capacity or performance of the existing system.

Installation on Sign Structures

1. Installations are not permitted on the median signs.
2. Cables should be placed inside the sign poles. If this is not possible, the proposal should be so that the cables/conduit can not be viewed by passing traffic.

3. An antenna panel can only be installed behind the sign panel. Other types may be installed on top of the right post if aesthetically not disturbing.
4. The sign with added component should be design checked and calculations should be submitted to Structure Maintenance for verification with a copy of design code used for calculation.
5. Special elements may be considered for large existing Overhead Truss Type Structures. Work related to mounting attachments will avoid alterations near the structures main and connections including primary members, bolts, and welds.
6. New structures or mounting of special attachments to existing sign and lighting structures shall require analysis according to Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 1994 by the American Association of State Highway and Transportation Officials.
7. All modified structures shall be considered for potential increase in vibration and fatigue and may be revised or returned to the original condition if warranted by the owner/operator.

Installation on Lighting Poles

1. Installation should be proportion to the size of the pole.
2. The combination of antenna (or camera) and the electric pole should be design checked.
3. All material should be dim, steel material should be hot dip galvanized.
4. Lighting structures both breakaway and non-breakaway types shall not be modified to accept additional attachments.
5. New structures or mounting of special attachments to existing sign and lighting structures shall require analysis according to Standard Specifications for Structural Supports for Highway Signs, Luminaires and Traffic Signals, 1994 by the American Association of State Highway and Transportation Officials.
6. All modified structures shall be considered for potential increase in vibration and fatigue and may be revised or returned to the original condition if warranted by the owner/operator.

Traffic Operations, Electrical Systems

1. The minimum radial clearance between overhead utility lines and any wireless equipment mounted on a lighting standard shall conform to the Electrical Safety Orders.

Nominal Voltage (Phase to Phase)	Minimum Clearance Required (Feet)
60050,000	10
over 50,00075,000	11
over 75,000125,000	13
over 125,000175,000	15
over 175,000250,000	17
over 250,000370,000	21
over 370,000550,000	27
over 550,0001,000,000	42

2. Placement of wireless equipment shall not interfere with the operation or obstruct the visibility of traffic signals, ramp meters, lighting, or other traffic control equipment.
3. Sharing of Caltrans conduit will not be permitted.
4. The electrical power circuits for Caltrans electrical facilities shall not be used for wireless communications facilities.

References

- California Administrative Code, Title 8: Industry Relations, Chapter 4: Division of Industrial Safety, Subchapter 5: Electrical Safety Orders (reference may be purchased through Barclay's Publishers #1-800-888-3600).
- California Department of Transportation, Standard Specifications
- California Department of Transportation, Standard Plans
- California Department of Transportation, Traffic Manual, Chapter 9.